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**Johnson et al.**

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(54) **RESONATOR AND PROCESS FOR PERFORMING BIOLOGICAL ASSAY**

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(57) **ABSTRACT**

A process for assaying a biological sample includes: receiving a reference sample by an acoustic article including: a resonator including: a substrate; a piezoelectric member; and a phase noise detector; disposing the reference sample on the piezoelectric member; producing a reference phase noise signal; detecting the reference phase noise signal; disposing a biological sample on the piezoelectric member; producing a first biological phase noise signal; detecting the first biological phase noise signal; contacting the biological sample disposed on the piezoelectric member with an antimicrobial agent; producing a second biological phase noise signal; detecting the second biological phase noise signal; and analyzing the first biological phase noise signal, the second biological phase noise signal, and the reference phase noise signal to assay the biological sample.

**16 Claims, 37 Drawing Sheets**

